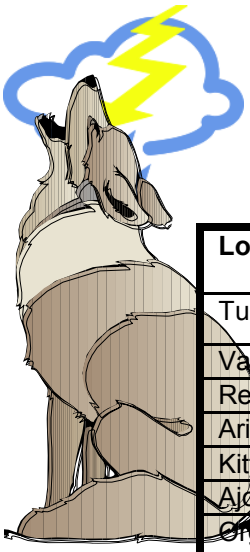
Volume 16, Issue 1

Fall /Winter 2010/2011

National Weather Service Tucson, Arizona

Coyote Crier



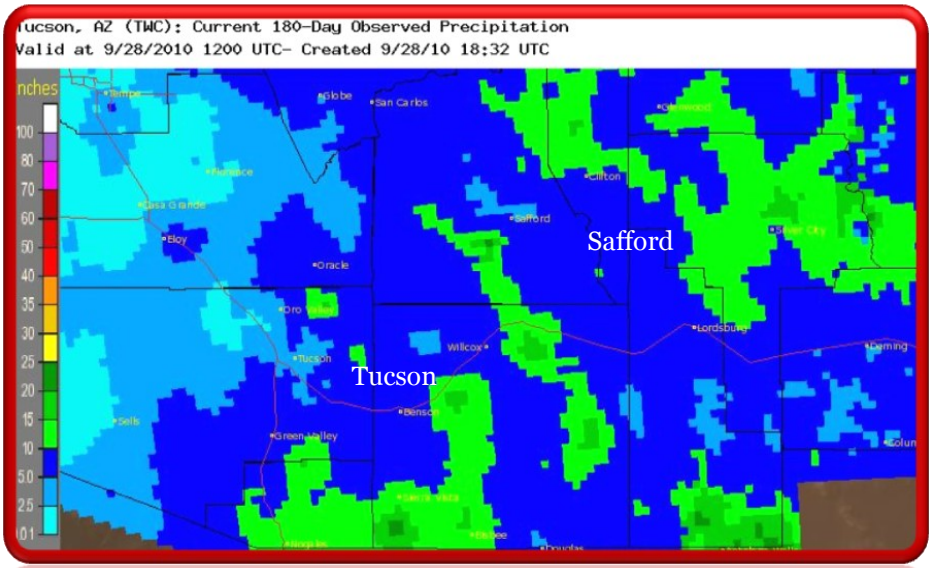
Monsoon 2010 Summary

John Glueck, Senior Forecaster and Climate Focal Point

The 2010 Monsoon was wetter than 2009. As is usually the case, rainfall totals varied widely across southeast Arizona along with who recorded above/below normal rainfall.

Location	2010	Normal	Location	2010	Normal
Tucson Intn' airport	5.45"	6.06"	Clifton	9.25"	6.13"
Vail	7.52"	6.86"	Cascabel	7.43"	6.98"
Redington	6.07"	7.03"	Benson	9.49"	7.89"
Arivaca	7.51"	10.27"	Pearce-Sunsites	8.12"	8.06"
Kitt Peak	5.68"	12.00"	Willcox	7.76"	6.62"
Ajo	1.38"	3.25"	Bisbee	8.21"	11.44"
Organ Pipe N. M.	1.18"	4.42"	Coronado N.M.	13.37"	10.66"
Picacho Peak	2.73"	3.65"	Sierra Vista	11.14"	8.53"
San Manuel	6.36"	6.88"	Tombstone	9.09"	8.05"
Nogales	9.71"	10.73"	Hereford	12.75"	8.85"
Patagonia	11.66"	10.11"	Bowie	8.93"	5.77"
Tumacacori N.M.	9.85"	9.94"	San Simon	5.47"	5.37"
Ft. Thomas	6.71"	3.94"	Douglas	8.78"	8.28"
Safford Ag. Center	5.43"	4.60"	McNeal	6.32"	7.06"
Duncan	7.35"	5.88"	Rucker Canyon	16.57"	11.05"

The image below is a 180 day rainfall total for the 2010 Monsoon. Areas east and south of Tucson recorded the most rainfall during the 2010 Monsoon.



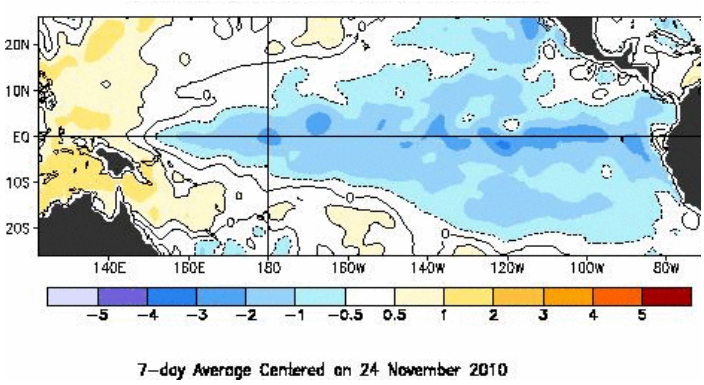
Inside this issue:

La Niña and the Winter Forecast for Southeast Arizona

Glen Sampson, Meteorologist In Charge

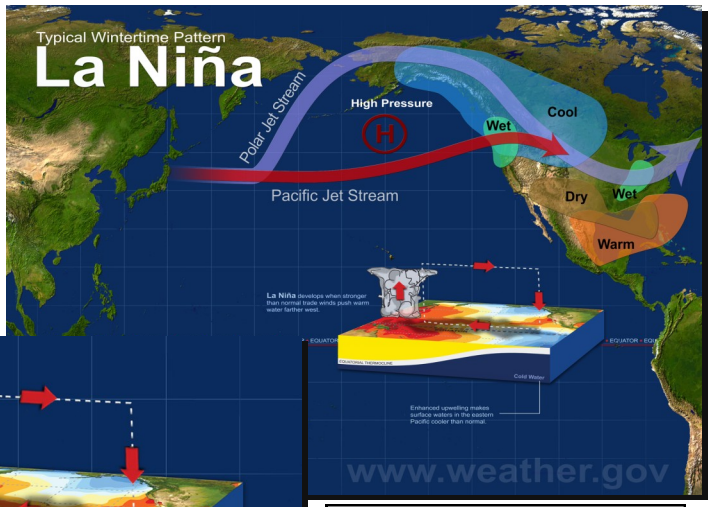
Strong La Niña conditions are present across the Pacific Ocean which will affect our wintertime weather. La Niña is characterized by below normal sea surface temperatures (SST). The SST anomalies for Thanksgiving week are depicted to the right.

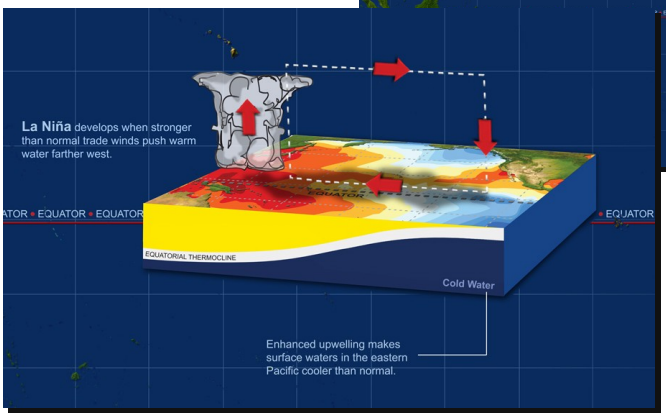
These anomalies show colder than average water temperatures across most of the Pacific Ocean. This abundance of cooler water in the Pacific affects our weather by shifting the storm track further north, which supports wetter/cooler conditions in the Pacific Northwest and drier/warmer conditions over us. The figure given to the right and below depicts these changes in the weather pattern. A drier winter tends to favor a more active wildfire season in March through June too.



7-day Average Centered on 24 November 2010

"Strong La Niña conditions are present across the Pacific Ocean which will affect our wintertime weather".





The forecasts for December through February are given below. The three month above average temperature forecast for the southern portion of the United States is on the left. The below average precipitation forecast over the Southwest is on the right.

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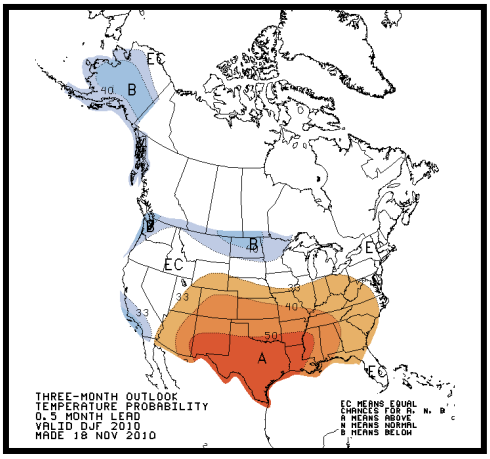
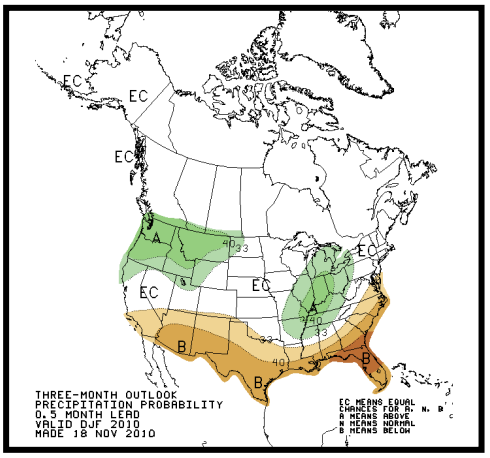
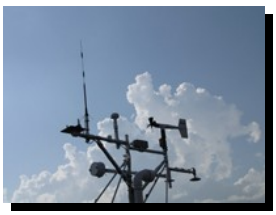






An Overview of the National Weather Service's Upper-Air Program

Scott Minnick, Meteorologist Intern

The entire realm of National Weather Prediction Models comes down to a balloon. Its not just a regular balloon, but one that carries instrumentation into the outer reaches of the atmosphere. The National Weather Service upper-air program consists of 92 stations in North America and the Pacific Islands, while offering support for 10 stations in the Caribbean. Every day, rain or shine, each location releases two balloons at the same time. One release is done at 12:00 Greenwich Mean Time (5:00am MST) and 00:00 GMT (5:00pm MST). The NWS upper-air program provides essential data for weather forecasts and research.

The balloon used is made of strong latex and is inflated using helium or hydrogen gas. As the balloon is released from the ground it is about five feet in diameter. It moves through the atmosphere at a rate of about one thousand feet per minute, and can reach into the stratosphere at heights up to 110,000 feet. The latex then gets so thin from stretching, it bursts. At the time of burst, the balloon diameter is roughly twenty-five feet. That's bigger than a car. The instrumentation device is called a radiosonde and measures temperature, pressure, humidity, and GPS location every tenth of a second. From these four measurements, over 20 meteorological variables can be calculated. The device is powered by a water activated battery that will last nearly two hours. An antenna will track the radiosonde via GPS as it ascends. The radiosonde is also connected to a parachute for a slow decent back to the ground.

The main purpose of launching weather balloons is to initialize the models with real-time data. All the data gathered from the radiosonde is transmitted from the weather forecast office to the National Center for Environmental Prediction (NCEP). NCEP then takes the data and plugs it into supercomputers. The supercomputers contain equations that are the basis for all our computer models. Surface data is easily attainable with numerous weather stations all across the world, but what is actually going on in the upper atmosphere is not always known. This makes the data obtained from weather balloons extremely important. There are other ways to ingest data into the supercomputers through satellite imagery, water vapor imagery, and airplane data, but weather balloons are the most accurate and detailed. Satellite and airplane data are great ways of attaining data for locations that do not release weather balloons.

The Tucson weather forecast office has been tasked with releasing weather balloons and it is up to us to help make the best forecasts possible, not only for Tucson but for the world.

"The main purpose of launching weather balloons is to initialize the models with real-time data. All the data gathered from the radiosonde is transmitted from the weather forecast office to the National Center for Environmental Prediction (NCEP)".

Weather Balloon launched from the roof of the NWS in Tucson.

Weather Story Graphics on our Web Page Are Now "Event" Driven

Greg Mollere, Senior Forecaster and Spotter Focal Point

Since the Spring of 2008 the National Weather Service in Tucson has been posting to our web page what was originally referred to as a "Graphicast". These were pictures of satellite imagery or model data to depict in a graphic format what the main weather problem would be during the next several days, or perhaps just in the next 24 hours. These so-called graphicast were issued at least once a day (more frequently in rapidly changing weather), mainly before sunrise each day.

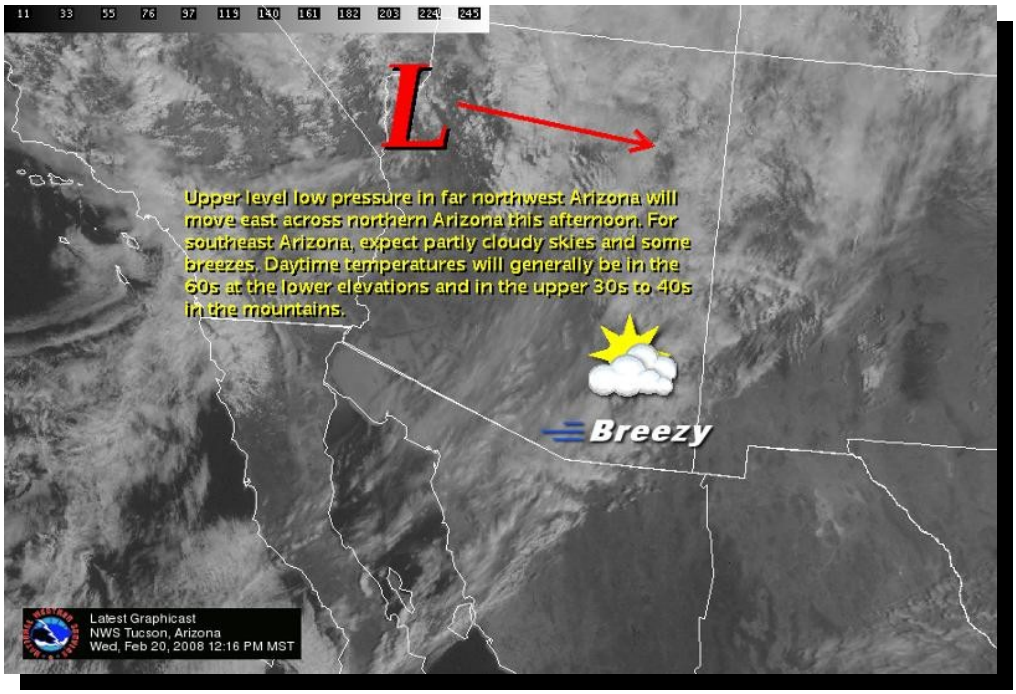
Over time the "Graphicast" became know as the "Weather Story", and were indentified on our web page by the state of Arizona Flag Icon.

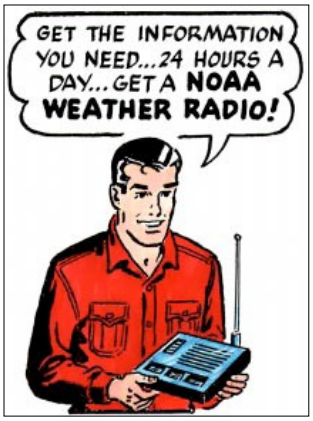
With our beautiful weather across southeast Arizona, there are plenty of times when the weather story would not depict much more than a map background of the state with an icon of a shining sun suggesting that the weather would be sunny for the next several days.

Since November 18th of this year the "Weather Story" has become event driven, which means that they will only be issued when weather of significance is expected during the next 7 days.

Hopefully this will be an improvement of our services, since the lack of a weather story icon on the web page will imply benign weather, but if a "weather story" appears you can be certain that changes in the weather are on their way.

"With our beautiful weather across southeast Arizona, there are plenty of times when the weather story would not depict much more than a map background of the state with an icon of a sun suggesting that the weather would be sunny for the next several days".





Please keep your personal information up-to-date. Do we have your correct mailing address, location, phone number and e-mail address? If not, please update us so that our database is as current as possible. The best way to update your information is by e-mail, or to call and speak with Greg Mollere. Thanks!

Greg.Mollere@noaa.gov

National Weather Service Tucson Public Forecast Zones

Kenneth Drozd, Warning and Coordination Meteorologist

The WFO Tucson county warning area consists of low deserts and high mountain ranges and varies in elevation from less than 1000 ft above mean sea level to just over 10,000 feet. Large elevation differences occur over relatively short horizontal differences creating what are known as "sky islands". This topographical complexity results in weather that varies tremendously over a horizontal distance of just a few miles.

In fact, many of the current forecast zones contain more than one climatic regime within them. The diversity of weather that occurs from one regime to the next is paralleled by the assortment of impacts resultant at each location. Population centers tend to be concentrated in the lower elevations while other points of interest such as observatories and recreation areas are often located near mountain peaks. See Figure 1.

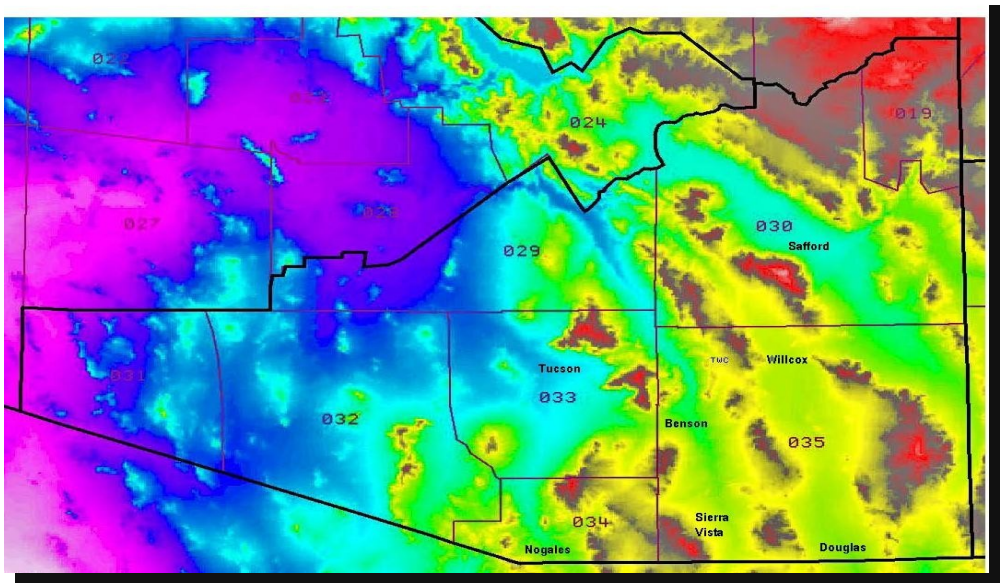


Fig. 1 Topographic Map Showing Old NWS Tucson Public Forecast Zones

"This topographical complexity results in weather that varies tremendously over a horizontal distance of just a few miles".

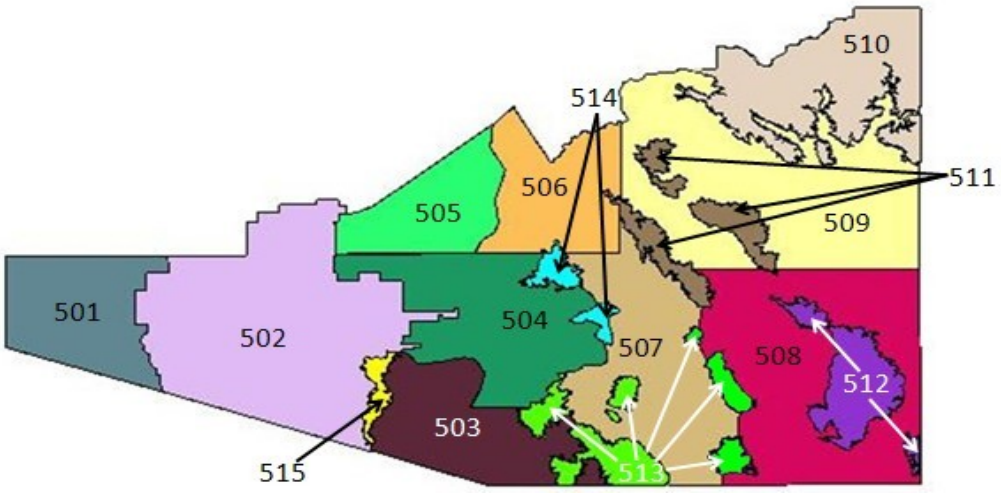
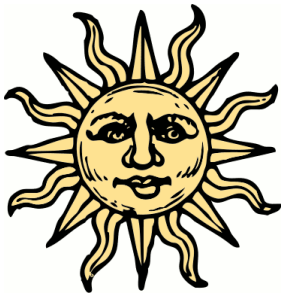


Fig. 2 New NWS Tucson Public Forecast Zones



National Weather Service Tucson Public Forecast Zones(Cont'd)

Kenneth Drozd, Warning and Coordination Meteorologist

The development of new public forecast zones in southeast Arizona was accomplished with input from members of the local media and the emergency management community in conjunction with forecasters with numerous years of experience in southeast Arizona at NWS Tucson. The following goals and benefits were determined.

1. Provide a higher standard of customer service by improving NWS product quality.
2. Improve the spatial accuracy of winter storm and high wind warnings.
3. Better incorporate climate and terrain into zone-based warnings.
4. Better serve the high population areas as well as special use areas.
5. Increase the ability to collaborate with neighboring NWS offices.

NWS Tucson staff and management feel strongly that this new public zone configuration will more accurately portray the topography, meteorology and climatology of southeast Arizona and result in a higher standard of customer service to partners and users of NWS forecast and warning information. See Figure 2 (previous page).

"The New Zones Will Improve the Spatial Accuracy of Winter Storm and High Wind Warnings".

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NEW ZONE CONFIGURATION HEADERS

AZZ501-050200-
WESTERN PIMA COUNTY-
INCLUDING ...AJO...ORGAN PIPE CACTUS NATIONAL MONUMENT

AZZ502-050200-
TOHONO O'ODHAM NATION-
INCLUDING...SELLS

AZZ503-050200-
UPPER SANTA CRUZ RIVER AND ALTAR VALLEYS-
INCLUDING... NOGALES

AZZ504-050200-
TUCSON METRO AREA-
INCLUDING...TUCSON...GREEN VALLEY...MARANA...VAIL

AZZ505-050200-
SOUTH CENTRAL PINAL COUNTY-
INCLUDING...ELOY...PICACHO PEAK STATE PARK

AZZ506-050200-
SOUTHEAST PINAL COUNTY-
INCLUDING...KEARNY...MAMMOTH...ORACLE

AZZ507—050200-
UPPER SAN PEDRO RIVER VALLEY-
INCLUDING...SIERRA VISTA...BENSON

AZZ508-050200-
EASTERN COCHISE COUNTY BELOW 5000 FEET-
INCLUDING...DOUGLAS...WILLCOX

AZZ509-050200-
UPPER GILA RIVER AND ARAVAIPA VALLEYS-
INCLUDING...CLIFTON...SAFFORD

AZZ510-050200-
WHITE MOUNTAINS OF GRAHAM AND GREENLEE COUNTIES-
INCLUDING...HANNAGAN MEADOW

AZZ511-050200-
GALIURO AND PINALENO MOUNTAINS-
INCLUDING...MOUNT GRAHAM

AZZ512-050200-
CHIRICAHUA MOUNTAINS-
INCLUDING...CHIRICAHUA NATIONAL MONUMENT

AZZ513-050200-
DRAGOON/MULE/HUACHUCA AND SANTA RITA MOUNTAINS-
INCLUDING...BISBEE...CANELO HILLS...MADERA CANYON

AZZ514-050200-
SANTA CATALINA AND RINCON MOUNTAINS-
INCLUDING...MOUNT LEMMON...SUMMERHAVEN

AZZ515-050200-
BABOQUIVARI MOUNTAINS-
INCLUDING...KITT PEAK